Kelly KDZ Sep-Ex Motor Controller User's Manual

Devices Supported:

KDZ48303GDV	KDZ48403GDV	KDZ48553GDV
KDZ60303GDV	KDZ60403GDV	KDZ60553GDV
KDZ72303GDV	KDZ72403GDV	KDZ72553GDV

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1. Overview

Kelly KDZ Sep-Ex motor controllers provide efficient, smooth and quiet controls for small and midsize electric vehicles. The original field function of KDZ controllers makes the Sep-Ex motor working high torque at low speed and saving battery energy at high speed, which brings together the advantages of Series motors and Brushless motors. Regenerative braking extends the cruising range of electric vehicles, and elevates driving safety.

2. Application

Kelly KDZ controllers are suitable for electric car, golf carts, go-carts, mini truck and forklifts, as well as movable police officer and industrial motor speed control.

3. Features

• Intelligence with powerful microprocessor.
• Synchronous rectification, ultra low drop, and fast PWM to achieve very high efficiency.
• Current limit and torque control.
•Low EMC.
•LED fault code. Easy test and maintenance.
•Battery protection: current cutback, warning and shutdown at configurable high and low battery voltage.
•The controller keeps monitoring battery recharging voltage during regenerative braking, progressively cutting back current as battery voltage rises then cutting off regen altogether when voltage goes too high.

• Thermal protection: current cut back, warning and shutdown at high temperature.

•Brake switch is used to start regen.The brake switch is valid to ground.

Forward and reversing switch are valid to battery voltage.The foot switch or

micorswitch is valid to 12V source.

•Prevent slipping backward on the uphill so as to insure driving safety.

• Configurable high pedal protection help prevent unsafe operation. The controller will not work if high throttle is detected at power on.

• Maximum reverse speed is configurable to half of the maximum forward speed.

• Configurable motor over-temperature detection and protection with the recommended thermistor KTY84-130.

• Standard Throttle Input: 0-5K(2-wire resistive pot), 0-5V (3-wire resistive pot), 1-4V (12V hall active throttle).**Offered a free 12V hall throttle together with the controller.**

•Full Power Temperature Range: 0 to 50 (controller case temperature).

•Operating Temperature Range: -30 to 90, 100 shutdown (controller case temperature).

•Configurable and programmable with a host computer though RS232 or USB. Provide free GUI which can run on Windows XP/2000, Windows 7 and Vista(recommend using Kelly Standard USB To RS232 Converter).

4. Functions

• This controller can be used to drive series wound motor or brushed PM motor if the Field switch is disabled in the user program.The Field terminals can be disconnected in this case.

• The Sep/Ex controller provides Field map function.Yes,if you disable the field switch,this controller can be used to drive the series wound motor or PM motor.The field can be disconnected.

Sorry,the current mode or voltage mode is grayed by default.These modes are used for fixed field current.The field current will not follow up anything.

So they are grayed in the user program.We are using the field map function.So you may ignore them.

If the field map is disabled,it will be fixed field current mode.This is not good.

As you can see,you can set up four parameters for field and armature current in the user program.These four parameters will determine the performance curve for Sep/ex motor controller.By default,the starting field current may not be set below 3-4%,otherwise the detection is not accurate. Please check the setting relation between Field and Armature.
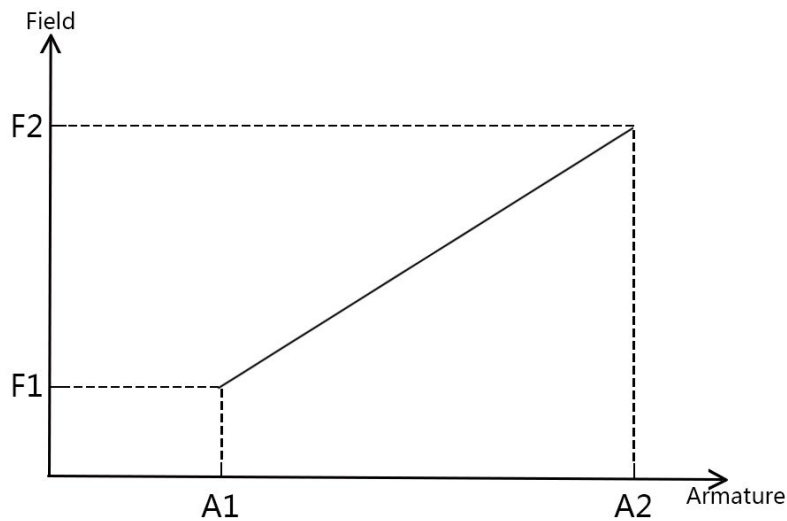
F1,It is for setting the field current at starting-up.

F2,It is for the max field current setting.

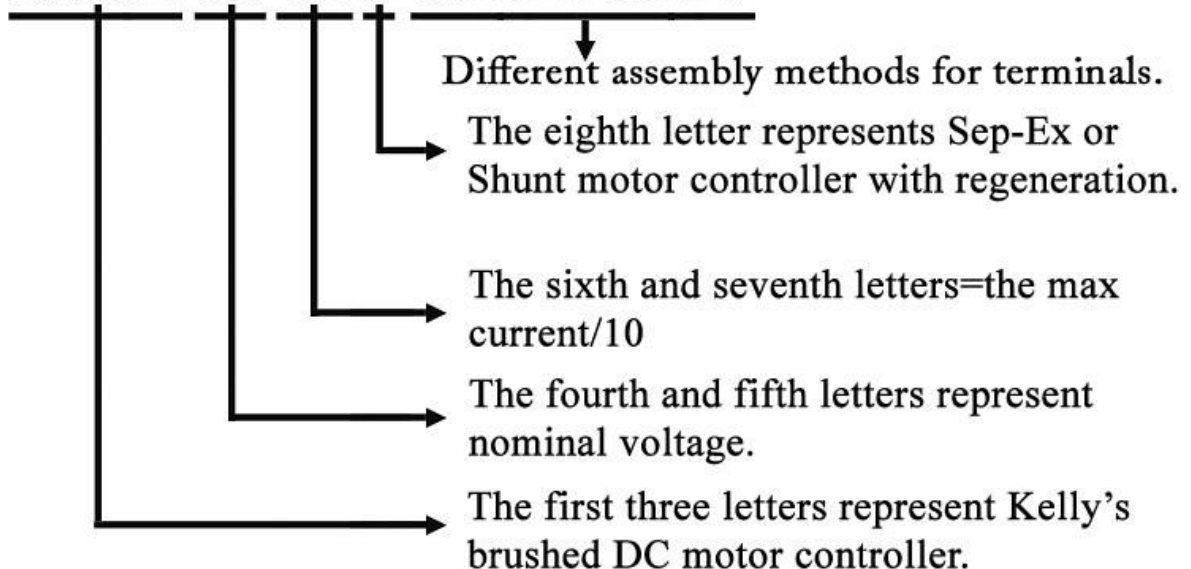A1,It is for setting the max armature current at the starting up.

A2,It is for the max armature current setting.

So the performance curve K=(F2-F1)/(A2-A1).

If you change one of the parameters,the acceleration rate or deceleration rate will be changed accordingly.

5. Naming Regulations

Different assembly methods for terminals.

The eighth letter represents Sep-Ex or Shunt motor controller with regeneration.

The sixth and seventh letters=the max current/10

The fourth and fifth letters represent nominal voltage.

The first three letters represent Kelly's brushed DC motor controller.

6. Standard Wiring
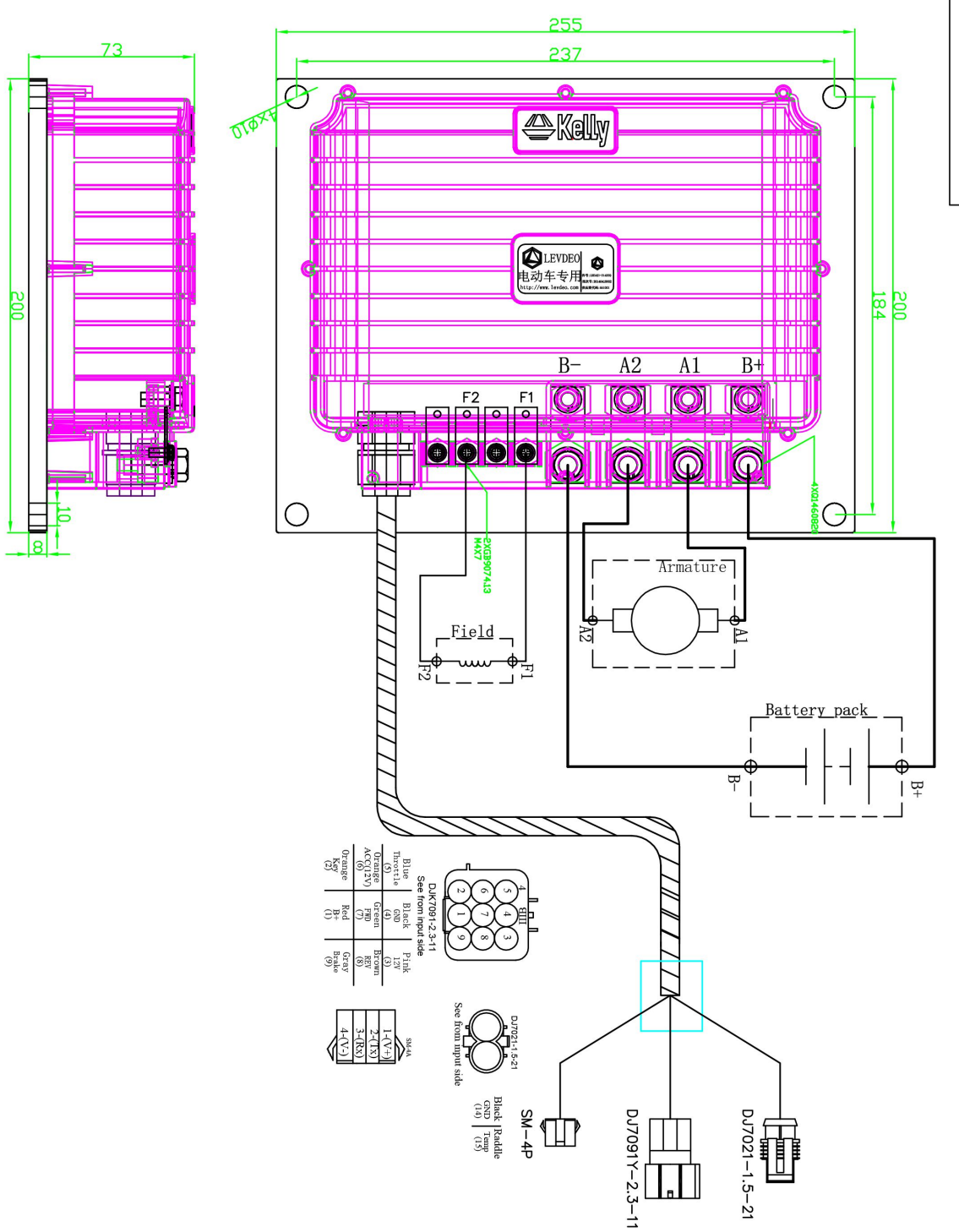
7. LED Fault Codes

RED LED CODES					
1，2	¤ ¤¤	Over voltage error	3，2	¤¤¤ ¤¤	Internal reset
1，3	¤ ¤¤¤	Low voltage error	3，3	¤¤¤ ¤¤¤	Wrong connection of throttle
1，4	¤ ¤¤¤¤	Over temperature warning	3，4	¤¤¤ ¤¤¤¤	Non-zero throttle on direction change
2，2	¤¤ ¤¤	Internal volts fault	4，1	¤¤¤¤ ¤	Regen over-voltage
2，3	¤¤ ¤¤¤	Over temperature	4，2	¤¤¤¤ ¤¤	Field error
2，4	¤¤ ¤¤¤¤	Throttle error at power up	4，3	¤¤¤¤ ¤¤¤	Motor over-temperature
3，1	¤¤¤ ¤	Frequent reset	4，4	¤¤¤¤ ¤¤¤¤	Hall sensor error
The Red LED flashes once at power on as a confidence check and then normally stays Off. "1, 2" means the Red flashes once and after a second pause, flashes twice. The time between two flashes is 0.5 second. The pause time between multiple flash code groups is two seconds.					

•Motor Current Limit, 1 minutes: 300-550A, depending on the model.

•Motor Current Limit, continuous:120-220A, depending on the model.

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